

WHAT IS CLAIMED IS:

1. A method comprising:

generating an electromagnetic radiation;

linearly polarizing at least a portion of the
radiation in a vicinity of a pupil plane of a projection
system to form linearly polarized radiation; and

exposing a substrate using the linearly polarized
radiation at a high exposure angle.

2. The method of claim 1, wherein said linearly polarizing
the radiation comprises linearly polarizing the radiation
in a direction dependant upon the exposure angle of the
radiation.

3. The method of claim 1, wherein said linearly polarizing
the radiation comprises increasing a proportion of
radiation polarized in a direction substantially
perpendicular to a propagation direction and
substantially parallel to a surface of the substrate.

4. The method of claim 3, wherein increasing the proportion
of radiation polarized in the direction comprises
completely linearly polarizing the radiation in the
direction.

5. The method of claim 1, wherein said linearly polarizing the radiation comprises transmission polarizing the radiation at the pupil plane.
6. The method of claim 1, wherein said linearly polarizing the radiation comprises birefringence polarizing the radiation at the pupil plane.
7. The method of claim 1, wherein said linearly polarizing the radiation comprises linearly polarizing an annular ring of radiation at the pupil plane.
8. The method of claim 1, wherein said linearly polarizing the radiation comprises linearly polarizing radiation in an opposing pair of regions at high exposure angles in the pupil plane.
9. The method of claim 1, wherein said high exposure angle is an angle greater than 45° .
10. The method of claim 1, wherein exposing the substrate comprises exposing the substrate at a low exposure angle using circularly polarized radiation.
11. The method of claim 1, wherein exposing the substrate comprises exposing the substrate using an immersion lithography system.

12. A method comprising:

generating an electromagnetic radiation;

shifting a phase of some of the radiation using an
alternating phase shift mask to define a pattern, the
5 pattern including

first features oriented with a main axis in a
first direction and

second features oriented with a main axis in a
second direction, the second direction being
10 substantially perpendicular to the first direction;

linearly polarizing at least a portion of the
radiation to form linearly polarized radiation; and

exposing a substrate using the linearly polarized
radiation at a high exposure angle.

15 13. The method of claim 12, wherein said linearly

polarizing the portion comprises linearly polarizing the
portion substantially perpendicular to a propagation
direction and substantially parallel to a surface of the
substrate.

20 14. The method of claim 12, wherein said linearly

polarizing the portion comprises linearly polarizing the
portion in a vicinity of a pupil plane of a projection
system.

15. The method of claim 12, further comprising exposing the substrate at a low exposure angle using a second portion of the generated electromagnetic radiation, the second portion not being linearly polarized.

5 16. The method of claim 15, wherein said exposing the substrate using the second portion comprises exposing the substrate using circularly polarized radiation.

17. The method of claim 12, wherein said exposing the substrate comprises exposing the substrate using
10 radiation forming an annular ring in the pupil plane.

18. The method of claim 12, wherein said exposing the substrate using the first portion comprises polarizing the electromagnetic radiation using a reflection polarizer.

15 19. The method of claim 12, wherein said high exposure angle comprise an exposure angle greater than 45°.

20. A lithography system comprising:

a stage to immobilize a substrate;

an electromagnetic radiation source to emit a

20 radiation; and

a projection system having a polarizer in a vicinity of a pupil plane to increase a proportion of radiation

linearly polarized in a direction substantially
perpendicular to a propagation direction of the radiation
and parallel to a surface of an immobilized substrate.

21. The system of claim 20, wherein the polarizer

5 comprises a perfectly linear polarizer to perfectly
linearly polarize the radiation.

22. The system of claim 20, wherein the polarizer

comprises a high exposure angle polarizer to increase the
proportion of linearly polarized radiation that is to
10 expose the substrate at a high exposure angle.

23. The system of claim 20, wherein the polarizer includes
an opposing pair of polarizing regions at high exposure
angles.

24. The system of claim 20, wherein the projection system

15 further comprises a unitary polarizer to increase the
proportion of linearly polarized at the pupil plane.

25. The system of claim 20, wherein the polarizer
comprises a transmission polarizer.

26. The system of claim 25, wherein the transmission

20 polarizer comprises an annular ring of polarizing
features.

27. The system of claim 20, wherein the polarizer
comprises a birefringence polarizer.

28. The system of claim 20, further comprising an
alternating phase shift mask.

5 29. A lithography system for forming microelectronic
devices, the improvement comprising a pupil plane
polarizer to polarize electromagnetic radiation that is
to expose a substrate at high exposure angles but not
polarize electromagnetic radiation at low exposure
10 angles.

30. The system of claim 29, wherein the polarizer is to
increase the proportion of linearly polarized
electromagnetic radiation in a direction perpendicular to
a propagation direction of the radiation and parallel to
15 a surface of a substrate.